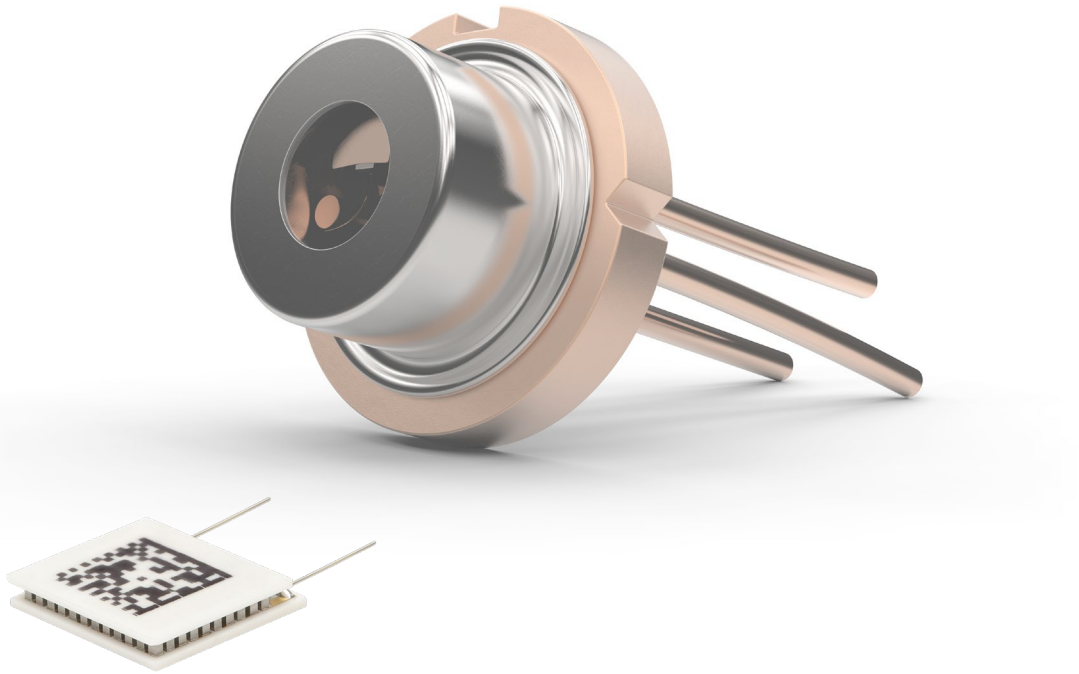
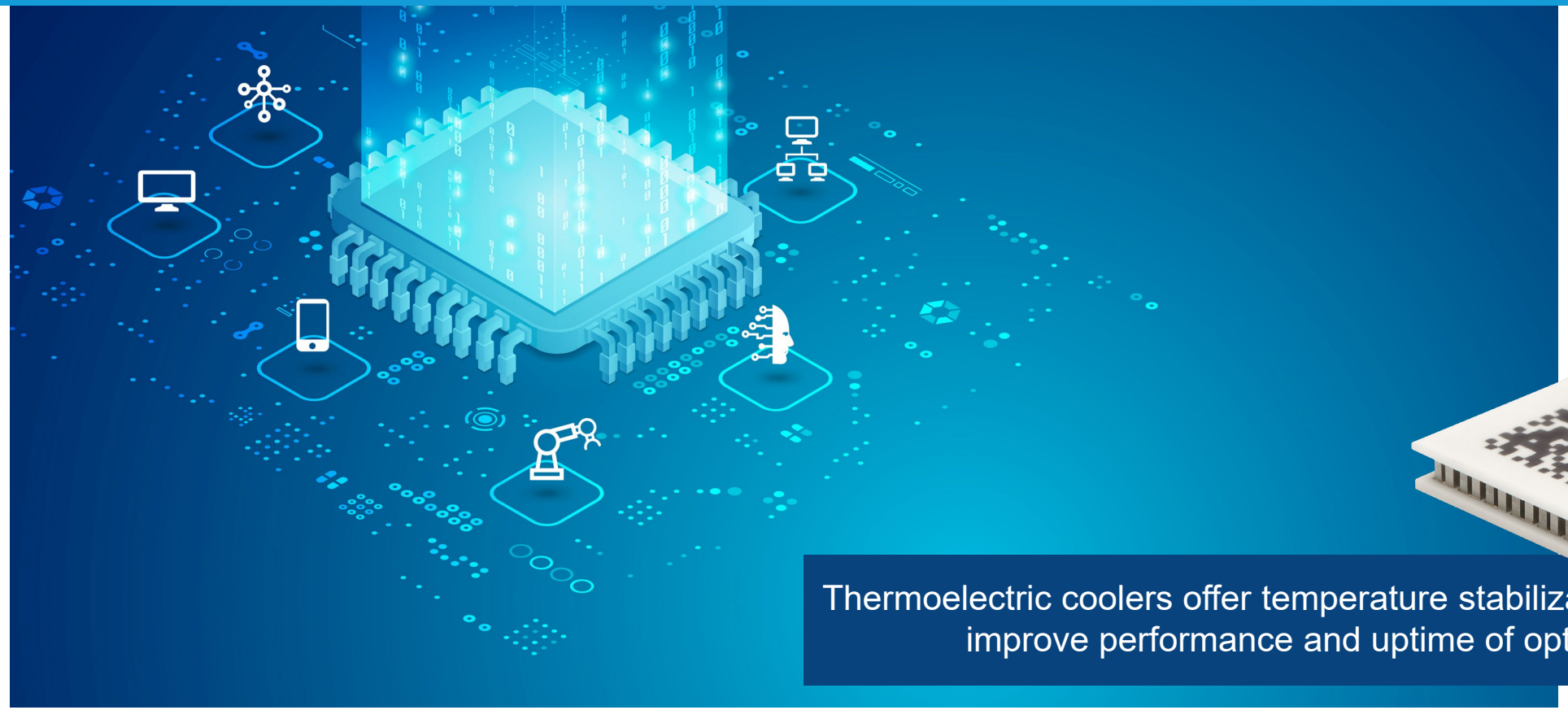
Laird™
THERMAL SYSTEMS

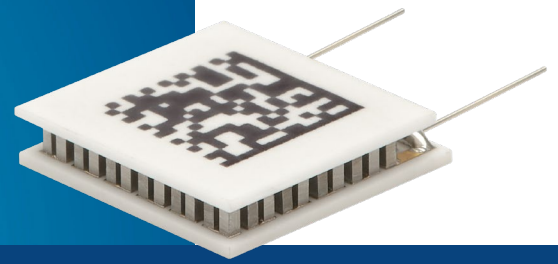


Advanced Thermoelectric Cooling for **Optoelectronics**

Introduction

Optoelectronics are used to source, detect and control light in a wide range of applications within telecom, autonomous and industrial applications.

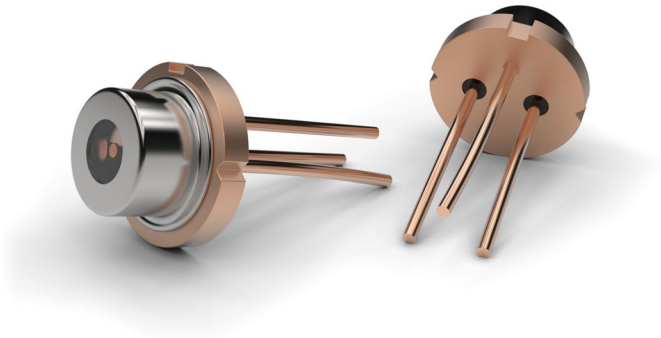




Thermoelectric coolers offer temperature stabilization in a small form factor to improve performance and uptime of optoelectronic devices

Laser Diodes & Optical Transcievers

Temperature Stabilization is required for maximum performance and long operational life of laser

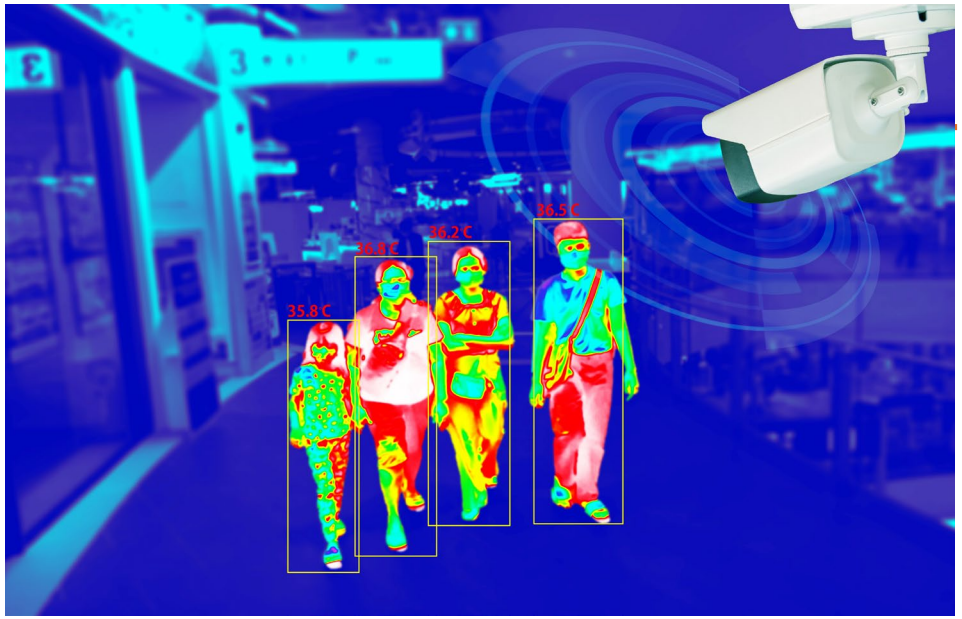


Temperature flucations will result in

- Loss of data
- Interupted transmission
- Less precise cut (industrial laser processing

Infrared Range Sensors

Active Cooling is required to enable high resolution images in maximum light spectrum



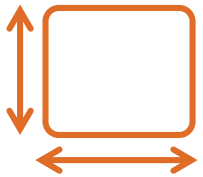
IR sensors must be cooled to overcome thermal noise, which is the difference between the target object and its surrounding environment

LiDAR

LiDAR Systems require a thermal management solution to provide high-quality images of objects or landscapes

High temperatures will distort laser wavelength and result in increased range error

Design Challenges



SPACE CONTRAINTS

Optoelectronic devices typically have small footprints

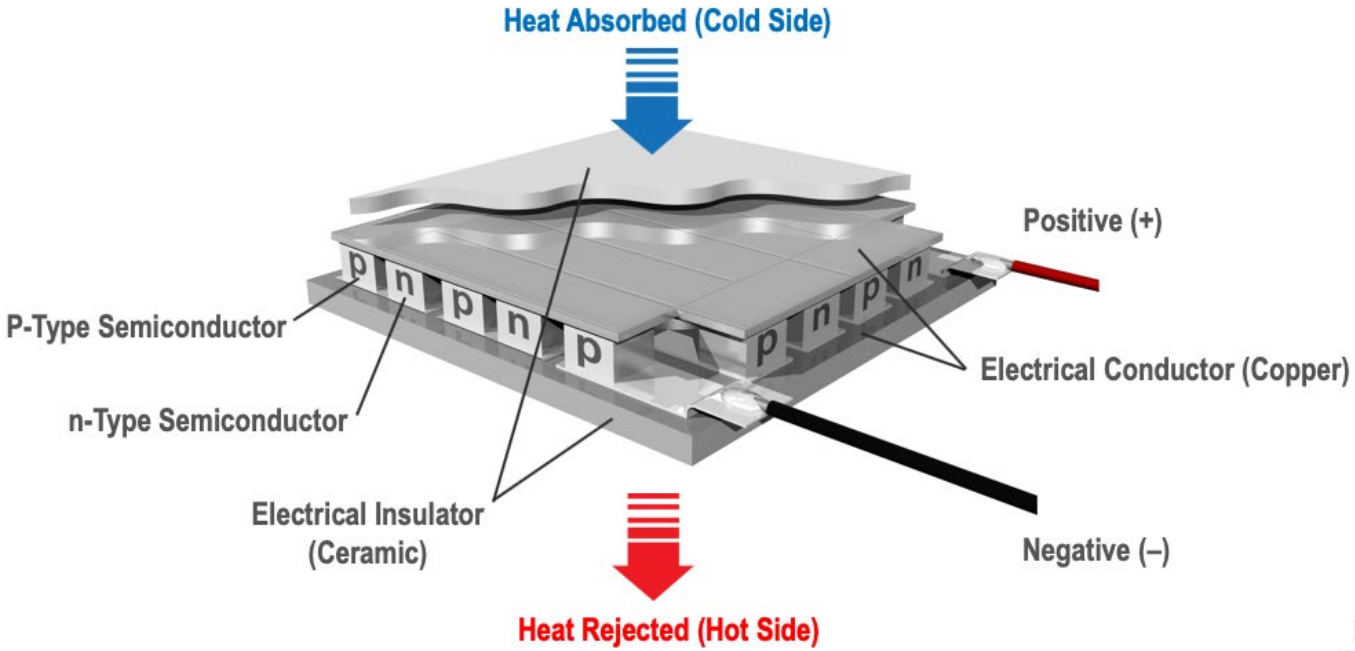
OUTGASSING

Outgassing from standard thermal interface material can coat optics

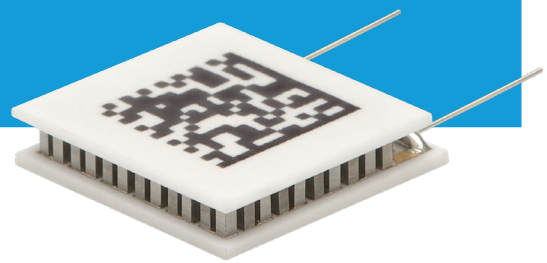
HIGH TEMPERATURES

High operating temperatures in extreme outdoor environments makes temperature stabilization challenging

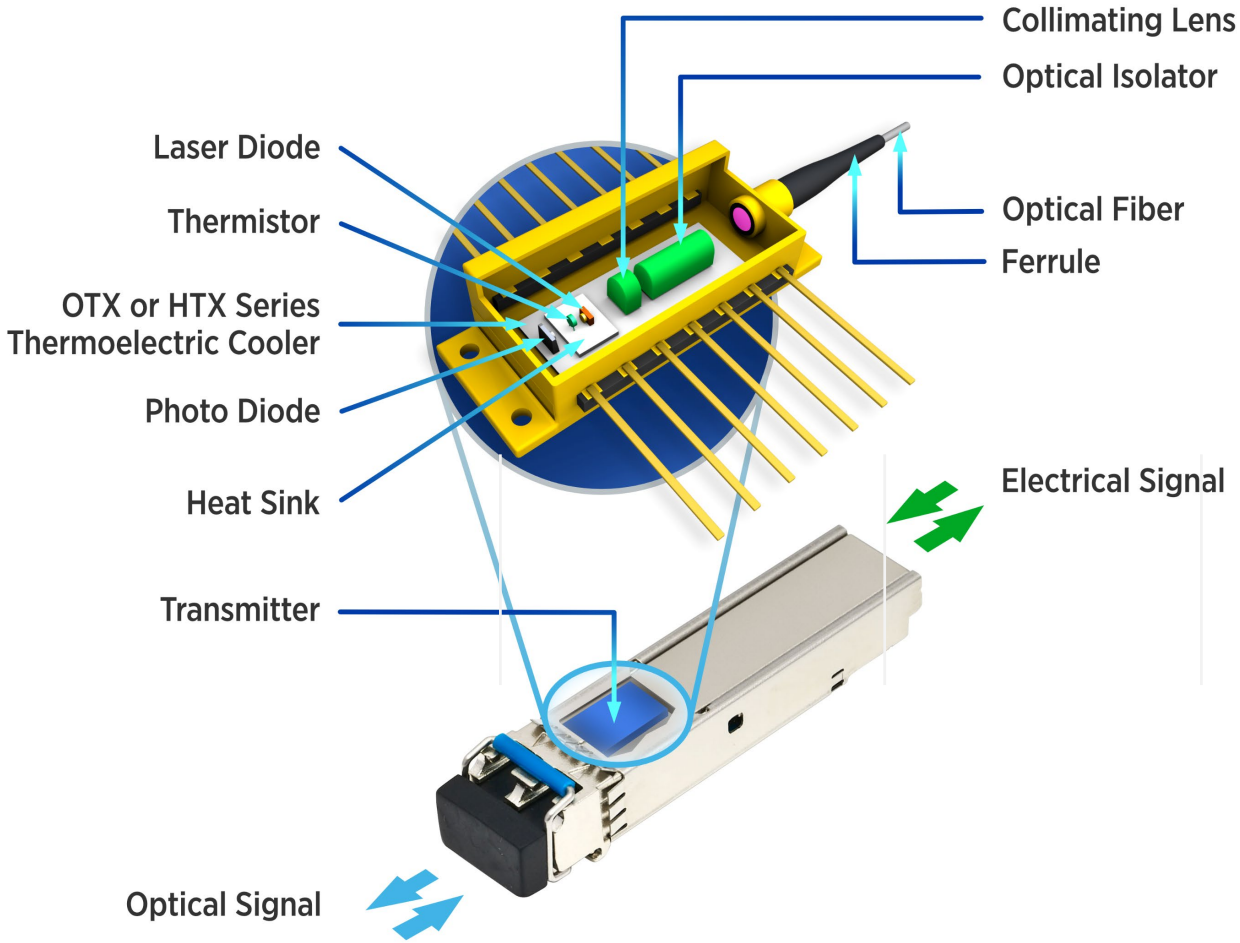
Thermoelectric Cooling



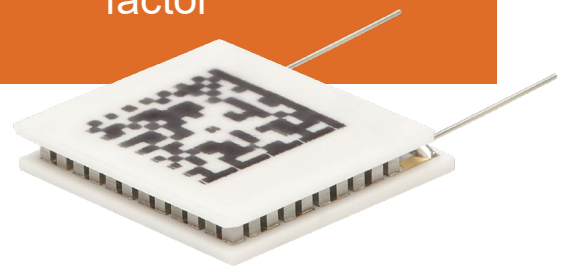
Thermoelectric coolers
rapidly dissipate heat away from sensitive electronics



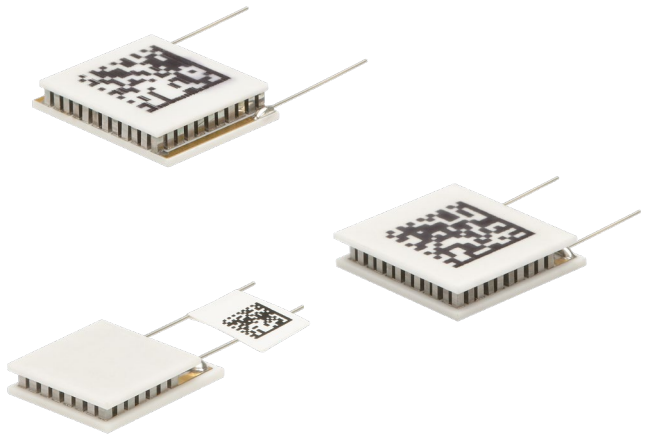
Thermoelectric Cooling of Laser Diodes



Miniature OptoTEC™ OTX/HTXThermoelectric coolers offers a high COP in an extremely small form factor



OptoTEC™ OTX/HTX Series



The OptoTEC™ OTX/HTX Series deliver high heat pumping capacity in a footprint smaller than 3 X 4 mm

HIGH PERFORMANCE

HIGH TEMPERATURE OPERATION

OTX: 120°C

HTX: 150 °C

HIGH COP

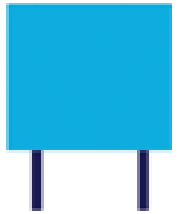
MINIATURE FORM FACTOR

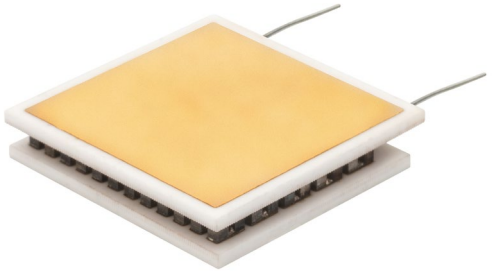
MEETS TELECORDIA REQUIREMENTS

LONG-LIFE OPERATION

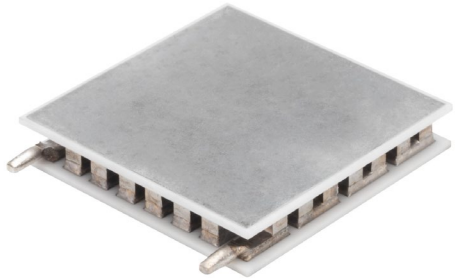
Custom Thermoelectric Coolers

Laird Thermal Systems offers a wide range of custom thermoelectric coolers to meet application specific requirements

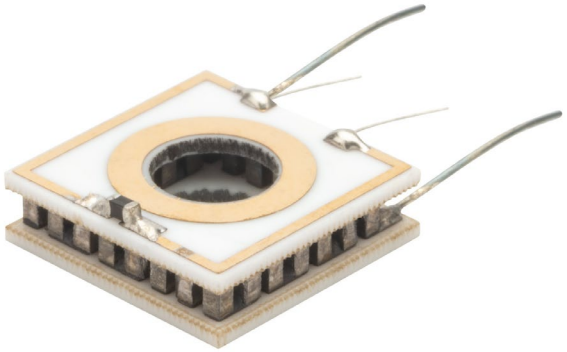




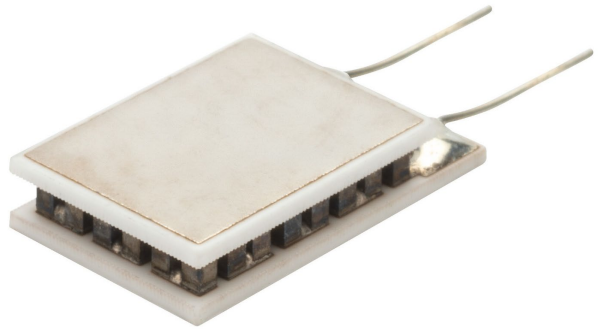
Gold (Au) Plating



Metallized Surface



Advanced Patterns



Pre-Tinning
Un-insulated Wire

Conclusion

Automotive, telecom and industrial applicatons utilize **optoelectronic technology** to source, detect and control light

Active cooling is reqired to maintain **peak performance** and **long-life operation** of optoelectornic devices

Thermoelectric coolers offers **great reliability** at **high COP** to a **low cost**

Designed for **high temperature environments** the OptoTEC™ OTX/HTX Series offers superior **temperature stabilization** in an **extremely small footprint**

For More Information

More information on the **OptoTEC™ OTX/HTX Series** can be found by visiting

https://www.lairdthermal.com/products/thermoelectric-cooler-modules/peltier-optotec-otx-htx-series

Read more about Thermoelectric Cooling for Optoelectronics in our **application note**

https://www.lairdthermal.com/index.php/thermal-technical-library/application-notes/advanced-thermoelectric-cooling-for-optoelectronics

About Laird Thermal Systems

Laird Thermal Systems develops thermal management solutions for demanding applications


Medical


Analytical


Industrial


Transportation


Telecom

DIVERSE PRODUCT PORTFOLIO
Thermoelectric Coolers, Thermoelectric Cooler Assemblies, Temperature controllers and Liquid Cooling Systems

SOLVING COMPLEX ISSUES
Our engineers use advanced thermal modeling and management techniques to solve complex heat and temperature control problems

ACCELERATING TIME-TO-MARKET
We partner closely with our customers across the entire product development lifecycle.

MAXIMIZING PERFORMANCE
Our global manufacturing and support resources help customers maximize productivity, uptime, performance and product quality

Laird Thermal Systems is the optimum choice for standard or custom thermal solutions

Learn more by visiting
www.lairdthermal.com

Laird™

THERMAL SYSTEMS

Have a question or need more information about
Laird Thermal Systems? Please contact us via the website at www.lairdthermal.com